

**Detailed Magnetometer Survey
Land at Ditchling Road, Wivelsfield,
East Sussex**

**NGR: 534220 120080
(TQ 34220 20080)**

**ASE Project No: 7516
ASE Report No. 2015177**

**Prepared on behalf of:
Bovis Homes and Charles William Baldock**

By John Cook BSc (Hons) ACiFA

May 2015

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Abstract

A magnetometer survey carried out by Archaeology South-East on a site totalling approximately c.5.2 hectares at Ditchling Road, Wivelsfield, East Sussex has provided limited evidence for possible archaeological features, represented by discrete positive anomalies.

The anomalies are representative of cut features such as pits and ditches. It is possible that a number may also relate to in filled natural features or more modern agricultural activity. Linear anomalies noted in the east of the area may also be associated with earlier agricultural activity such as ridge and furrow. Areas of magnetic debris correspond to a bank, interpreted as a possible former boundary. An area of magnetic debris, corresponds to an entrance way to an enclosure, and may relate to consolidation activity.

Some of the features identified may be the result of more recent agricultural activity, infilling of natural features or combination of these.

Statement of Indemnity

Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.

CONTENTS

1.0	INTRODUCTION
2.0	ARCHAEOLOGICAL BACKGROUND
3.0	SURVEY METHODOLOGY
4.0	GEOPHYSICAL SURVEY RESULTS
5.0	CONCLUSIONS

Bibliography
Acknowledgements

Appendix. Raw survey data (CD)
HER Summary

Figures

Front cover:	General site view looking north
Figure 1:	Site location
Figure 2:	Location of geophysics survey
Figure 3:	Raw data
Figure 4:	Processed data
Figure 5:	Interpolated data
Figure 6:	Interpretation
Figure 7:	Site photographs

1.0 INTRODUCTION

1.1 Site background

1.1.1 Archaeology South-East was commissioned by Bovis Homes Ltd and Charles William Baldock to conduct a magnetometer survey on a site totalling approximately c.5.2 hectares of land at Ditchling Road, Wivelsfield, East Sussex henceforth referred to as 'the site' (NGR. 534220 120080; Figure 1).

1.2 Geology and topography

1.2.1 According to the British Geological Survey (BGS 2015a) the bedrock geology of the site predominately comprises Weald clay formation - mudstone. No superficial deposits are recorded at the site. No boreholes are recorded on the BGS Borehole Viewer (BGS 2015b) on or in the immediate vicinity of the site.

1.2.2 The site consists of pasture land, with evidence for former arable use. The site is mainly level with some small undulations and bounded by wire fences and mature trees.

1.3 Aims of geophysical investigation

1.3.1 The purpose of the geophysical survey was to detect any buried archaeological anomalies that might provide a measurable magnetic response.

1.4 Scope of report

1.4.1 The scope of this report is to report on the findings of the survey. The project was conducted by John Cook with the assistance of Catherine Douglas. The project was managed by Neil Griffin (fieldwork) and Jim Stevenson (post fieldwork).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.2.1 The following information is taken from the prior desk-based assessment (DBA) of the site undertaken by Archaeology South-East (ASE 2015).

2.2 Prehistoric

2.2.2 There are no records attributed to the Prehistoric period within the 1km Study Area.

2.3 Romano-British

2.2.3 The HER records six references to Romano-British sites within the 1km Study Area.

2.2.4 Excavations for the installation of a gas main on Jenners, Green Road, located c. 850m to the southeast of the Site, revealed possible worked flint and signs of burning that have been attributed to the general prehistoric/Romano-British period. This site now forms Archaeological Notification Area 1710.

2.2.5 A watching brief, located c. 500m north of the Site, for the construction of a new driveway revealed a spread of charcoal fragments, Romano-British pottery sherds and possible post holes. This may be linked to a previously unknown Romano-British settlement at Wivelsfield focused on the crossing point of two prehistoric trackways.

2.2.6 Church Lane - Romano-British artefacts found by a metal detectorist. The location of the find is within Wivelsfield Archaeological Notification Area 122 and Wivelsfield Conservation Area, located c. 700m northwest of the Site.

2.2.7 A 4th century Romano-British coin was found in a garden located adjacent to the southeast corner of the Site boundary.

2.2.8 A Romano-British copper alloy brooch was found c. 350m southeast of the Site.

2.2.9 Romano-British artefacts and features found at Moat House, located c. 400m to the north of the Site. A large charcoal rich spread was also recorded during the construction works which appeared to be bound by a shallow gully. A large assemblage of Romano-British pottery was recovered, as well as bloomer slag. This area lies within Wivelsfield Archaeological Notification Area 122.

2.4 Anglo-Saxon

2.4.1 This period can be divided into an Early Saxon period (c.AD410-c.AD650) and a Late Saxon period (c.650-1066). Most finds for the early period are confined to the South Downs and adjacent landscapes (White 1999). Few

settlement sites have been identified and most archaeological information comes from cemeteries. The Late Saxon period seems appears to be have been a time of great change. By the mid-11th century a network of towns and other centres performing administrative, commercial and Christian religious functions had developed.

2.4.2 The area of densest Saxon settlement in Sussex is thought to have lain between the Ouse and Cuckmere rivers, as identified from the cemetery evidence. The Weald generally resisted major encroachment until the 10th century (Everitt 1986, 54). Such colonisation as there was tended to be from coastal parishes using the Wealden resources of timber and pasturage. Many temporary settlements established at this time developed into permanent farmsteads and hamlets.

2.4.3 At around AD 765, Wivelsfield was referred to as Wifelesland (Glover 1975, 185), meaning 'Wifel's open land' (8). The church at Wivelsfield - St Peter and St John The Baptist's Church (7), a Grade II* Listed Building, located c. 700m northwest of the Site, may have been constructed before the Conquest (Ford 1998, 8). There has never been a manor of Wivelsfield; the Domesday Book records that Berth, a farm in the parish of Wivelsfield, was in 1086 an estate of 1½ hides belonging to William de Warenne, and was probably part of the manor of Hurstpierpoint. Other lands in Wivelsfield are later found included in the manors of Ditchling and Plumpton (VCH 1940, 119).

2.5 Medieval

2.5.1 The Norman conquest of 1066 saw the establishment of a new land tenurial system, closely based on the former Saxon estates. The divisions of land known as 'rapes' were held and administered by Norman Lords.

2.5.2 By the time the Domesday survey was compiled, the Wealden landscape was mainly pastoral but also included some early irregular open-field systems that were later enclosed. Woodland was extensive, and was managed as part of the agricultural system. The settlement pattern was largely dispersed in nature. Little evidence of medieval settlement exists within Haywards Heath, which appears to been used as common pasture.

2.5.3 The buildings within the hamlet of Wivelsfield at this time, were developed on land belonging to the Otehall Estate (Lewes District Council, 2004)

2.5.4 The HER records six entries attributed to the medieval period.

2.6 Post-medieval

2.6.1 The landscape around Haywards Heath remained rural and sparsely settled into the post-medieval period. Early maps show a scatter of settlement around the centre of the modern town – this was heathland at the time, utilised as common waste, and the settlement probably represents piecemeal encroachment by squatters. Haywards Heath itself only began to develop following the construction of the railway in 1841 but Wivelsfield remained isolated, population growth taking place at nearby Wivelsfield

Green (Harris 2005).

3.0 SURVEY METHODOLOGY

3.1 Geophysical survey

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across two enclosures, as depicted on Figure 2 (NGR 516350 115250). The work was undertaken between 13th and 15th May 2015 during cold, dry weather, and strong winds.

3.2 Applied geophysical instrumentation

3.2.1 The Fluxgate Gradiometer employed was the Bartington Instrumentation Grad 601-2. The Grad 601-2 has an internal memory and a data logger that store the survey data. This data is downloaded into a PC and is then processed in a suitable software package.

3.2.2 30m x 30m grids were set out using a GPS (see below). Each grid was surveyed with 1m traverses; samples were taken every 0.25m.

3.2.3 Data was collected along north-south traverses in a zigzag pattern beginning in the south west corner of each grid, following the contours of the site.

3.3 Instrumentation used for setting out the survey grid

3.3.1 The survey grid for the site was geo-referenced using a Leica Viva Smartrover. The GPS receiver collects satellite data to determine its position and uses the mobile phone networks to receive corrections, transmitting them to the RTK Rover via Bluetooth to provide a sub centimetre Ordnance Survey position and height. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

3.4 Data processing

3.4.1 All of the geophysical data processing was carried out using TerraSurveyor published by DW Consulting. Minimally processed data was produced using the following schedule of processing. Due to the very high positive readings of some of the magnetic disturbance, the values were replaced with a dummy value so as to avoid detrimentally affecting the dataset when further processed. The first process carried out upon the data was to apply a DESPIKE to the data set which removes the random 'iron spikes' that occur within fluxgate gradiometer survey data. A ZERO MEDIAN TRAVERSE was then applied to survey data. This removes stripe effects within grids and ensures that the survey grid edges match.

3.5 Data presentation

3.5.1 Data is presented using images exported from TerraSurveyor into Autocad software and inserted into the geo-referenced site grid. Data is presented as raw data, processed data, an interpolated data greyscale plot, and a red greyscale blue plot.

4.0 GEOPHYSICAL SURVEY RESULTS

4.1 Description of site

- 4.1.1 The survey area consisted of approximately c.5.2 hectares of pasture land, *bounded by hedges, wire fences and woodland.*
- 4.1.2 The site consists of pasture land, with evidence for former arable use, with small areas of woodland.

4.2 Survey limitations

- 4.2.1 Physical obstructions encountered on site included fences, feeders and agricultural equipment (Figure 7a). Obstructions for each area are noted in the results. In addition, the effectiveness of magnetometer surveys depends on a contrast between the absolute magnetic susceptibility of the topsoil to the underlying subsoil (Clark 1996). Features may also be difficult to detect where there has been significant primary silting and development of significant overburden. Areas where physical obstructions form a barrier to survey, or a health and safety issue, have been omitted. The site lies over mudstone geology. An average response to magnetometer is possible, although results may be variable (English Heritage 2008).

4.3 Introduction to results

- 4.3.1 The results should be read in conjunction with the figures at the end of this report (Figures 3, 4, 5, 6 and 7). The types of features likely to be identified are discussed below.
- 4.3.2 *Positive Magnetic Anomalies*
Positive anomalies generally represent cut features that have been in-filled with magnetically enhanced material.
- 4.3.3 *Negative Magnetic anomalies*
Negative anomalies generally represent buried features such as banks or compacted ground that have a lower magnetic signature in comparison to the background geology.
- 4.3.4 *Magnetic Disturbance*
Magnetic disturbance is generally associated with interference caused by modern ferrous features such as fences and service pipes or cables.
- 4.3.5 *Magnetic Debris*
Low amplitude magnetic debris consists of a number of dipolar responses spread over an area and is indicative of ground disturbance.
- 4.3.6 *Dipolar Anomalies*
Dipolar anomalies are positive anomalies with an associated negative response. These anomalies are usually associated with discreet ferrous objects or may represent buried kilns or ovens.

4.3.7 *Bipolar Anomalies*

Bipolar anomalies consist of alternating responses of positive and negative magnetic signatures. Interpretation will depend on the strength of these responses; modern pipelines and cables typically produce strong bipolar responses.

4.3.8 *Thermoremanence*

Thermoremanence is most commonly encountered through the magnetizing of clay through the firing process although stones and soils can also acquire thermoremanence.

4.3.9 Magnetism from ferromagnetic materials (iron) and from thermoremanence are forms of permanent magnetism and in most cases a magnetometer will not enable the separation of anomalies into the two categories. The interpretation of these anomalies into either category relies on field strength within an area. Magnetic anomalies due to iron normally rise and fall rapidly, forming a 'spike' in the data.

4.4 Interpretation of fluxgate gradiometer results (Figure 6)

4.4.1 The interpretation of fluxgate gradiometer results should be read in conjunction with the figures at the end of the report. Specific examples of anomaly types are numbered in the figures and text but not all anomalies are numbered.

4.4.2 The site consists of parts of a series of level enclosures that, at the time of the survey were under grazing.

4.4.3 Evidence of possible archaeological activity was, in general, sparse and included the following described anomalies. The most obvious possible archaeological anomalies are moderate positive anomalies, noted as A1, and may be due to cut features such as a gullies. Due to the form of these anomalies it is likely that they relate to natural infilled features. Further discrete positive anomalies occur across the site (A2) and may represent cut features such as pits. However, these anomalies may also relate to in filled natural features.

4.4.4 Areas of magnetic debris (A3, A4) may relate to a scattering of near surface ferrous material, ground disturbance or made ground. In particular the anomalies noted running across the centre of the site (A3) appear to correspond to an existing low bank noted in the DBA (ASE 2015) as a former field boundary.

4.4.5 Dipolar anomalies (A5) are observed across the area. These anomalies may relate to thermoremanent material such as that due to kilns and furnaces or, more likely, near surface ferrous objects.

4.4.6 Magnetic disturbance (A6) is observed throughout the enclosures and relates to interference from nearby ferrous objects such as fences, feeders and other agricultural equipment (Figure 7a).

- 4.4.7 Positive linear anomalies associated with agricultural activity are observed in the north and east of the site (A7-A9). The spacing of the lines at A8 may indicate former ridge and furrow. This may correlate with possible ridge and furrow noted at A7 (Figure 7c).
- 4.4.8 Possible land drains (A10) and former field boundary (A11) are observed in the south of the site.

5.0 CONCLUSIONS

5.1 Discussion

- 5.1.1 Limited evidence for possible archaeological features was represented by discrete positive anomalies. These are representative of cut features such as pits and ditches. It is possible that a number of these anomalies may also relate to in filled natural features or more modern agricultural activity. Linear anomalies noted in the east of the area (A8) are observed, which may relate to earlier agricultural activity such as ridge and furrow. Areas of magnetic debris (A5), correspond to a bank (Figure 7a), interpreted as a possible former boundary. An area of magnetic debris (A6) corresponds to an entrance way to an enclosure and may relate to consolidation activity.
- 5.1.2 Some of the features identified may be the result of more recent agricultural activity, infilling of natural features or combination of these.

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Acknowledgements

Archaeology South-East would like to thank Bovis Homes Ltd for commissioning the survey and Bill Baldock for his hospitality.

HER Summary

Identification Name and Address	Detailed Magnetometer Survey Land at Ditchling Road, Wivelsfield					
County, District &/or Borough	East Sussex					
OS Grid Refs.	516350 115250					
Geology	Weald clay formation - mudstone					
Arch. South-East Project Number	7211					
Type of Fieldwork	Eval.	Excav.	Watching Brief	Standing Structure	Survey	Other
Type of Site	Green Field	Shallow Urban	Deep Urban	Other		
Dates of Fieldwork	Eval.	Excav.	WB.	13 th – 15 th May 2015		
Sponsor/Client	Bovis Homes Ltd and Charles William Baldock					
Project Manager	Neil Griffin					
Project Supervisor	John Cook					
Period Summary	Palaeo.	Meso.	Neo.	BA	IA	RB
	AS	MED	PM	Other Modern		
<p>Summary</p> <p><i>A magnetometer survey carried out by Archaeology South-East on a site totalling approximately c.5.2 hectares at Ditchling Road, Wivelsfield, East Sussex has provided limited evidence for possible archaeological features, represented by discrete positive anomalies.</i></p> <p><i>The anomalies are representative of cut features such as pits and ditches. It is possible that a number may also relate to in filled natural features or more modern agricultural activity. Linear anomalies noted in the east of the area may also be associated with earlier agricultural activity such as ridge and furrow. Areas of magnetic debris correspond to a bank, interpreted as a possible former boundary. An area of magnetic debris, corresponds to an entrance way to an enclosure, and may relate to consolidation activity.</i></p> <p><i>Some of the features identified may be the result of more recent agricultural activity, infilling of natural features or combination of these.</i></p>						

Oasis Form

OASIS ID: archaeol6-211574

Project details

Project name	Detailed Magnetometer Survey Land at Ditchling Road, Wivelsfield, East Sussex
Short description of the project	<p>A magnetometer survey carried out by Archaeology south-East on a site totalling approximately c.5.2 hectares at Ditchling Road, Wivelsfield, East Sussex has provided limited evidence for possible archaeological features, represented by discrete positive anomalies.</p> <p>The anomalies are representative of cut features such as pits and ditches. It is possible that a number may also relate to in filled natural features or more modern agricultural activity. Linear anomalies noted in the east of the area may also be associated with earlier agricultural activity such as ridge and furrow. Areas of magnetic debris correspond to a bank, interpreted as a possible former boundary. An area of magnetic debris, corresponds to an entrance way to an enclosure, and may relate to consolidation activity.</p> <p>Some of the features identified may be the result of more recent agricultural activity, infilling of natural features or combination of these.</p>
Project dates	Start: 13-05-2015 End: 15-05-2015
Previous/future work	Yes / Not known
Any associated project reference codes	7516 - Contracting Unit No.
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 4 - Regularly improved
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Housing estate
Prompt	Planning condition
Position in the planning process	Not known / Not recorded
Solid geology	WEALD CLAY
Drift geology	Unknown
Techniques	Magnetometry

Project location

Country	England
Site location	EAST SUSSEX LEWES WIVELSFIELD Land at Ditchling Road, Wivelsfield
Postcode	RH17 7PZ
Study area	5.20 Hectares
Site coordinates	TQ 34220 20080 50.9639257783 -0.0884300672662 50 57 50 N 000 05 18 W Point

Project creators

Name of Organisation	Archaeology South-East
Project brief originator	Archaeology South-East
Project design originator	Archaeology South-East
Project director/manager	Neil Griffin/Jim Stevenson
Project supervisor	John Cook
Type of sponsor/funding body	Bovis Homes Ltd
Name of sponsor/funding body	Bovis Homes Ltd

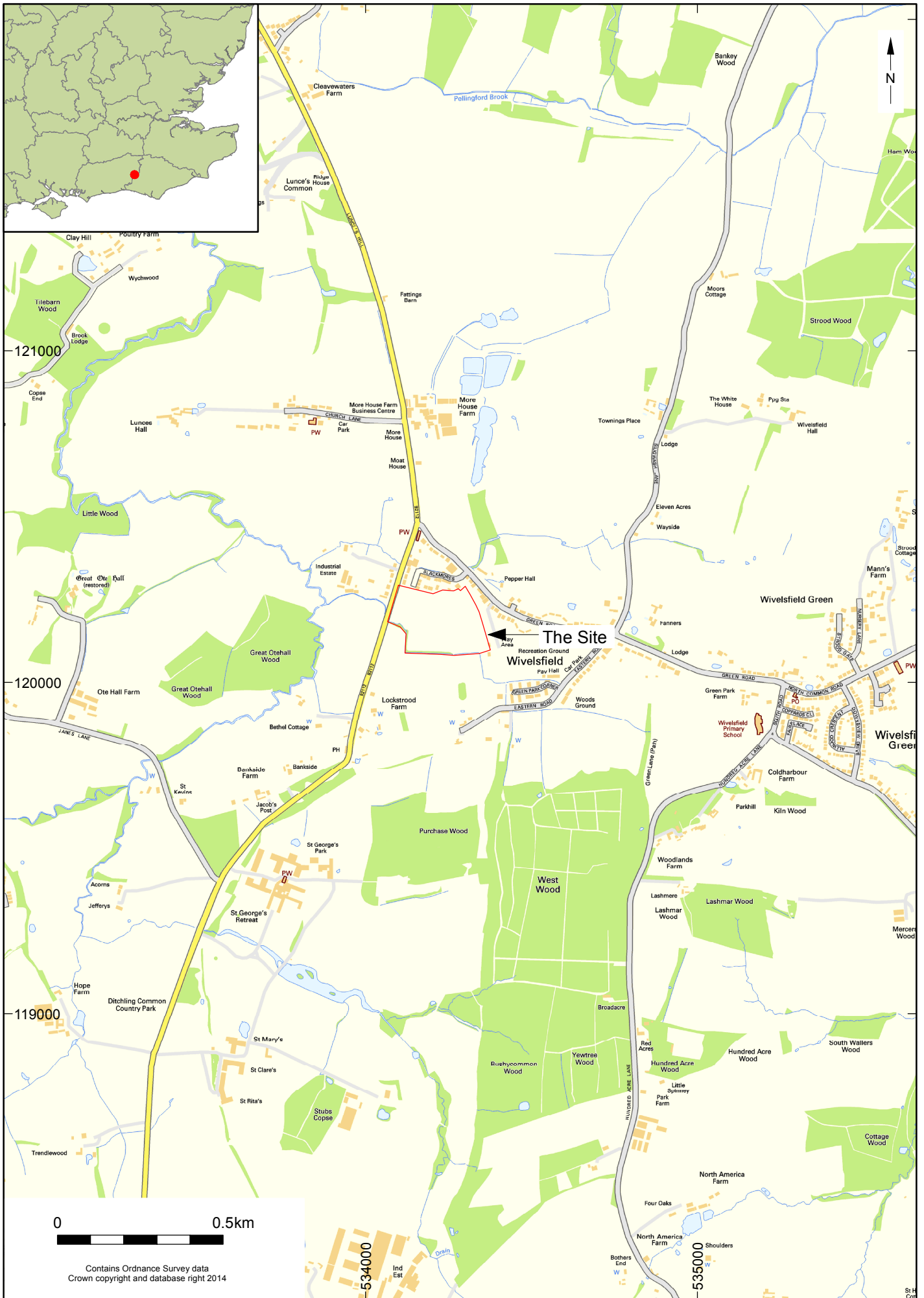
Project archives

Digital Archive recipient	East Sussex Records Office
Digital Contents	"Survey"
Digital Media available	"Geophysics","Images raster / digital photography","Text"
Paper Archive recipient	Unknown
Paper Contents	"Survey"
Paper Media available	"Report","Survey ","Unpublished Text"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Detailed Magnetometer Survey Land at Ditchling Road, Wivelsfield, East Sussex
Author(s)/Editor(s)	Cook, J.
Other bibliographic details	report number 2015177
Date	2015
Issuer or publisher	ASE
Place of issue or publication	Portslade

Entered by	John Cook (john.cook@ucl.ac.uk)
Entered on	20 May 2015

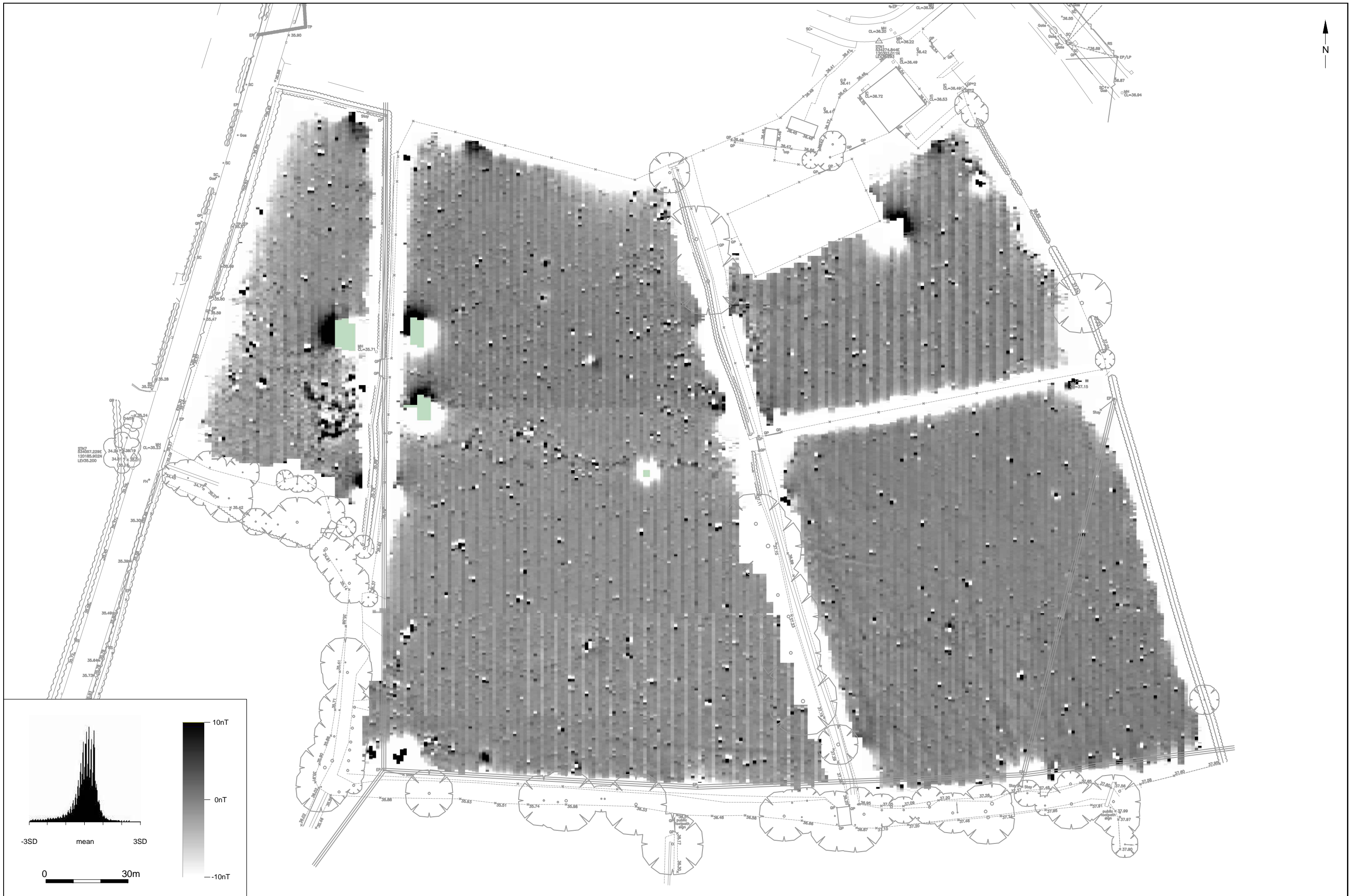


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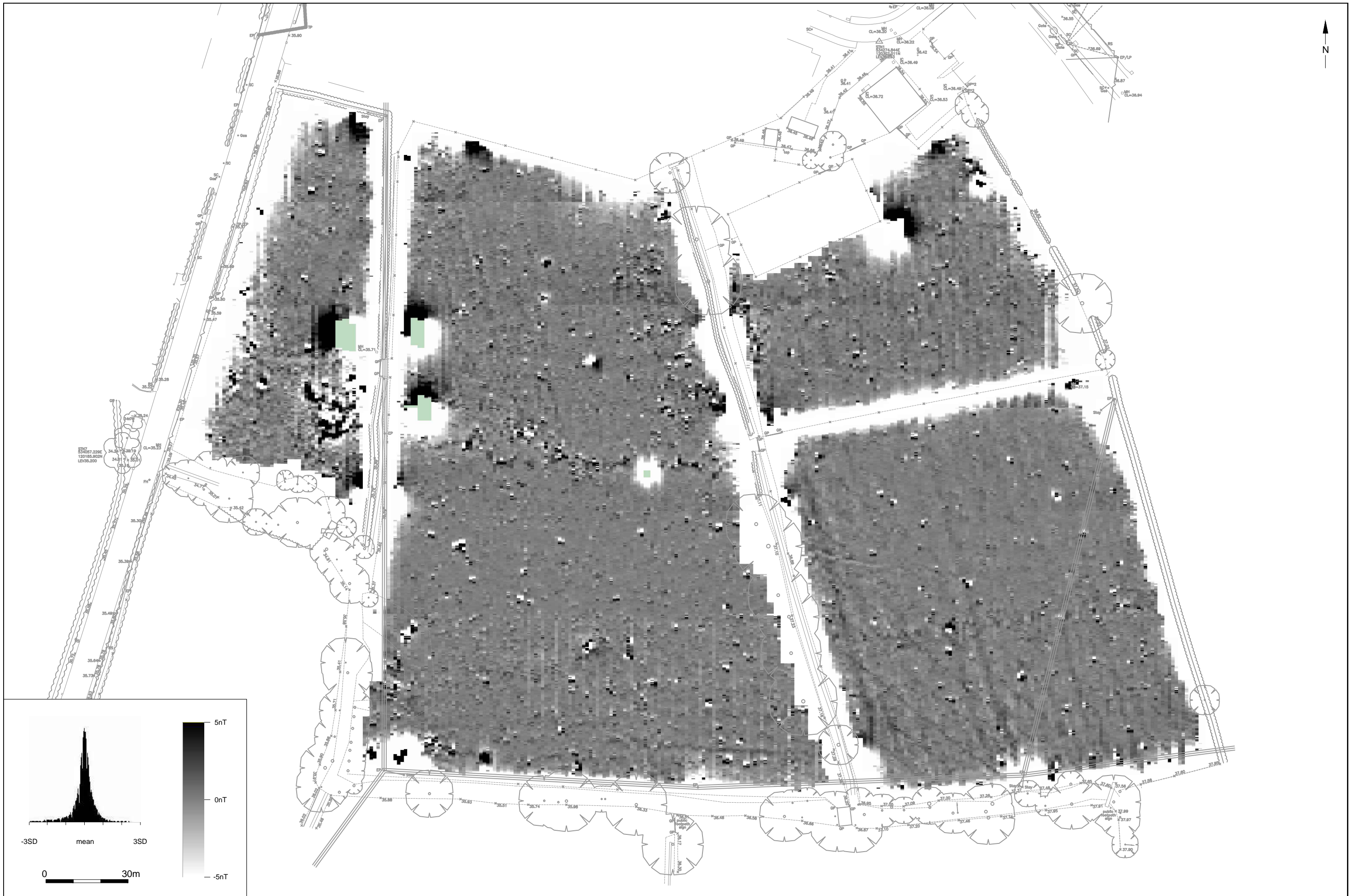
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Project Ref: 7516	May 2015	Site location	
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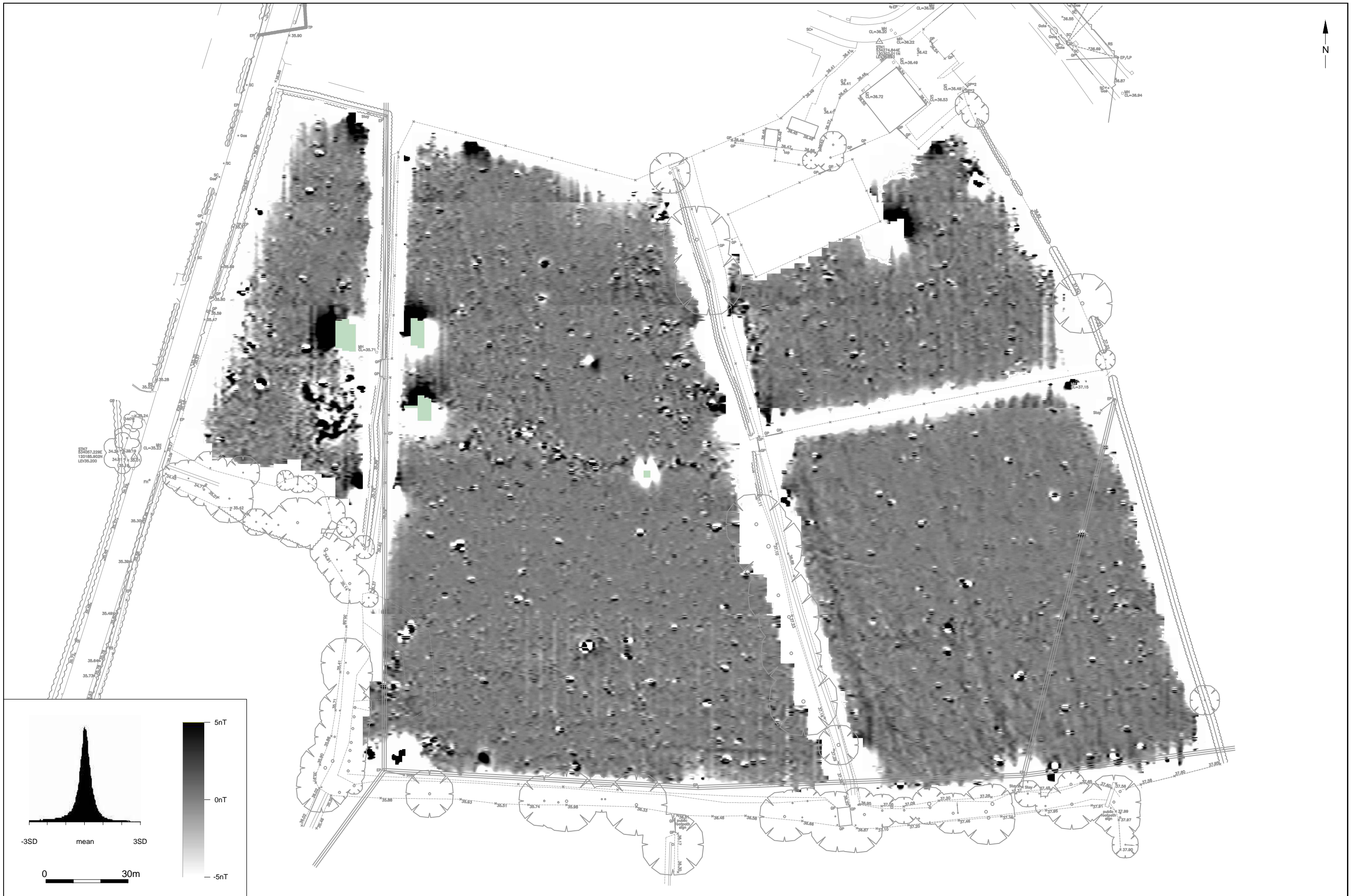
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Project Ref: 7516	May 2015	Location of geophysical survey	
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Project Ref: 7516	May 2015	Raw data	
Report Ref: 2015177	Drawn by: JC		



© Archaeology South-East		Land at Ditchling Road, Wivelsfield, East Sussex	Fig. 4
Project Ref: 7516	May 2015	Processed data	
Report Ref: 2015177	Drawn by: JC		



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Project Ref: 7516	May 2015	Interpolated data	
Report Ref: 2015177	Drawn by: JC		





Fig. 7a the site looking south, showing fences, feeder and possible ridge and furrow



Fig. 7b south eastern corner of the site



Fig. 7c central area of the site looking south, agricultural equipment and start of low bank



Fig. 7d low bank running through centre of site looking south



Fig. 7e central enclosure facing west

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